

SINGLE HEAD LASER HIGH THROUGHPUT LASER SHOCK PEENING

ABSTRACT

A laser unit in a laser shock peening apparatus for generating a primary laser beam along a primary beam path includes a pulsed free running oscillator with only a single lasing rod. An electro-optic switch external to the free running laser oscillator is operably disposed along the primary beam path to block the initial slow rise time of the primary laser beam from the free running oscillator and reject energy away from the primary beam path. At least one optical transmission circuit is used to form at one stationary laser beam from the primary laser beam and direct the stationary laser beam towards at least one laser shock peening target area. A delay generator controllably connected to the electro-optic switch is used to reject energy away from the primary beam path along a dump path to a dump and sharpen pulses of the primary laser beam.